

Title (en)

METHOD FOR PREVENTING WINDUP IN PID CONTROLLERS EMPLOYING NONLINEAR GAIN

Title (de)

VERFAHREN ZUM VERMEIDEN VON WINDUP IN PID-REGLERN DURCH NICHTLINEARE VERSTÄRKUNG

Title (fr)

PROCEDE A GAIN NON LINEAIRE POUR LA PREVENTION DE L'EMBALLEMENT DES REGULATEURS PID

Publication

EP 1004060 A1 20000531 (EN)

Application

EP 98942075 A 19980817

Priority

- US 9816997 W 19980817
- US 91856397 A 19970822

Abstract (en)

[origin: WO9910781A1] A method of preventing windup in a PID controller when using a nonlinear gain parameter is disclosed that is used in the PID controller of a process control system. The PID controller is arranged to produce within a current execution cycle a Control Variable (CV) to a device that is controlling a process responsive to an input Process Variable (PV), a setpoint (SP), and a gain parameter (K). The present invention receives the PV, the SP, and the K and generates a proportional, integral, and derivative component of the deviation of the PV from the SP. The components so generated are used to calculate an incremental output CV for the current execution cycle. A current value of gain is next calculated by subtracting the value of the gain for the current cycle from the value of the gain from the previous cycle. Testing for a linear or nonlinear gain parameter is done next and, responsive to a nonlinear gain parameter, a nonlinear gain change component is calculated and added to the incremental output CV. An output CV is generated for the current execution cycle by adding the incremental output CV modified by the nonlinear gain change component to the CV value of the previous execution cycle. The accumulated sum of proportional, integral, and derivative components of previous execution cycles are updated with the proportional, integral, and derivative components generated by the current execution cycle. These accumulated values will be used in calculating the nonlinear gain change component in the next cycle. However, if the testing identifies a linear gain parameter, the nonlinear gain change calculation is skipped and the output CV is generated by adding the incremental output CV to the CV value of the previous execution cycle.

IPC 1-7

G05B 11/42; **G05B 5/01**

IPC 8 full level

G05B 13/02 (2006.01); **G05B 5/01** (2006.01); **G05B 11/42** (2006.01)

CPC (source: EP US)

G05B 5/01 (2013.01 - EP US); **G05B 11/42** (2013.01 - EP US)

Citation (search report)

See references of WO 9910781A1

Designated contracting state (EPC)

DE FR GB

DOCDB simple family (publication)

WO 9910781 A1 19990304; AU 740014 B2 20011025; AU 9020898 A 19990316; CA 2297289 A1 19990304; CA 2297289 C 20060124; CN 1122901 C 20031001; CN 1267371 A 20000920; DE 69808779 D1 20021121; DE 69808779 T2 20030724; EP 1004060 A1 20000531; EP 1004060 B1 20021016; JP 2001514404 A 20010911; US 6055459 A 20000425

DOCDB simple family (application)

US 9816997 W 19980817; AU 9020898 A 19980817; CA 2297289 A 19980817; CN 98808378 A 19980817; DE 69808779 T 19980817; EP 98942075 A 19980817; JP 2000508036 A 19980817; US 91856397 A 19970822